

Abstract

An electrically tunable Fabry-Perot structure using a deformable multi-layer mirror construction wherein  $\text{Ga}_{1-a}\text{Al}_a\text{As}$ , where  $a < 0.1$ , is used as the sacrificial layer which may be selectively removed using a citric acid etchant. The multi-layer mirrors consist of N and M period of quarter wavelength layers where N and M are integers, or integers plus  $1/2$ . Further, the mirrors are made from alternating layers of  $\text{Ga}_{1-x}\text{Al}_x\text{As}$ , where  $x > 0.96$ , and a material selected from the group consisting of either  $\text{Ga}_{1-z}\text{Al}_z\text{As}$ , where  $0.7 > z > 0$ , or  $\text{Ga}_{1-y}\text{Al}_y\text{As}/\text{Ga}_{1-z}\text{Al}_z\text{As}/\text{Ga}_{1-y}\text{Al}_y\text{As}$ , where  $0.7 > z > 0$  and  $y > 0.5$ . The  $\text{Ga}_{1-x}\text{Al}_x\text{As}$  is wet oxidized by exposing its edge to water in a nitrogen or helium atmosphere at a temperature of between about  $360^\circ\text{C}$  and  $450^\circ\text{C}$  so as to transform it to  $\text{AlO}_x$ . The resulting  $\text{AlO}_x$  layers abut the sacrificial layer and act as etch stops during the formation of a cantilever Fabry-Perot structure by etching of the sacrificial layer.